BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

IN RE APPLICATION NO. 99-1 SUMAS ENERGY 2 GENERATION FACILITY	EXHIBIT _____(MW-T)

APPLICANT'S PREFILED DIRECT TESTIMONY

WITNESS # 7: MICHAEL WOLTERSDORF

Q. Please introduce yourself to the Council.

A. My name is Michael Woltersdorf.

Q. What is the subject of your testimony?

A. My testimony concerns the safety aspects of the proposed project. In particular, I will address the following topics:

First, my background and experience.

Second, the safety aspects of the generating facility itself.

Third, the safety aspects of the storage tank for backup diesel fuel.

Fourth, the safety aspects of the chemical storage at the facility.

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Background

Q. What is your occupation and title?

A. I am a Risk Control Specialist at Parker, Smith & Feek, Inc. (PS&F), an insurance brokerage firm. Based in Bellevue, Washington, PS&F is one of the largest privately owned insurance services firms of its kind.

Q. What do you do as a Risk Control Specialist?

A. As a Risk Control Specialist, I provide assistance and resources in the areas of safety and accident prevention that relate to the insurance products provided to our clients. Among other things, I consult with clients about project design, work with clients to improve their management processes, inspect facilities, and coordinate risk control inspections from insurance companies.

Q. What is your background?

A. I have worked in the insurance industry for twelve years. For the past five years, I've been a Risk Control Specialist for PS&F. Prior to that, I was a Senior Engineering Consultant for Aetna Insurance Company for five years, and a Loss Control Consultant for Cigna Insurance Company for two years. At both Aetna and Cigna, I assisted clients in developing safety and fire protection programs. Before working for these insurance companies, I spent two years as a Field Representative for the Washington Surveying and Rating Bureau, evaluating building sprinkler systems.

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I have a B.A. in Chemistry from Pacific Lutheran University in Tacoma. A copy of my resume is provided as Exhibit ____ (MW-1).

Q. Do you have professional certifications?

A. Yes. I am a Certified Fire Protection Specialist (CFPS), certified by the National Fire Protection Association (NFPA). I am a Chartered Property Casualty Underwriter (CPCU), an Associate in Risk Management (ARM) and an Associate in Loss Control Management (ALCM).

Q. What is the nature of your involvement with the SE2 project?

A. For the past four years, I have had responsibility for the NESCO account at PS&F. In that capacity, I periodically inspect NESCO facilities, including the SE1 Cogeneration Facility and the adjacent SOCCO lumber facility. If the SE2 facility is built, I anticipate that I will be consulted further regarding the final design of the facility and I will be involved in inspecting that facility in connection with the insurance coverage. At this time, SE2 has asked me to review the initial design of the facility and to offer my expert opinion about the safety measures that they have incorporated in the design.

Q. What is the basis of your knowledge about the proposed project?

A. I have met extensively with David Eaden, SE2 Vice President, and John Rivers, SE2 engineer, and I have discussed the proposed project design with them. I have also reviewed the Sumas Energy 2 Generation Facility Application for Site Certification Agreement (Jan. 1999) ("the Application"), and other related materials.

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Generation Facility

Q. Please describe the safety features of the SE2 generation facility itself.

A. According to the Application, the combustion turbine generator units will be equipped with a specialized fire detection and protection system. Gas detectors will alarm when combustible gas in the combustion turbine unit enclosures reaches 25% of the Lower Explosive Limit (LEL). If the combustible gas concentration increases to 60% of the LEL, the gas detectors will shut down the combustion turbine, which will close the gas supply valve. Vent fans in the turbine enclosure will then clear the combustible gas. Thermal fire detectors and smoke detectors will also be located throughout the combustion gas turbine generator enclosure. Excessive heat or smoke will trip the detectors and result in the release of dry fire extinguishers or fire smothering gas.

Water will be stored on site for fire suppression. There will be a 1,000,000 gallon water tank, with 500,000 gallons reserved for fire suppression use only, and the remaining 500,000 gallons used operational purposes. Two parallel fire pumps will supply a fire suppression system that will loop around the project site.

Q. Does the proposed design comply with applicable codes and standards?

A. Yes, the proposed design meets and in some areas exceeds the applicable National Fire Protection Association (NFPA) standards, which are typically more stringent than corresponding provisions of the Uniform Fire Code. The major NFPA Standards that apply to this sort of facility are the following:

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NFPA 13, Standard for the Installation of Sprinkler Systems;

NFPA 30, Flammable and Combustible Liquids Code;

NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protect;

NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines;

NFPA 54, ANSI Z223.1 National Fuel Gas Code;

NFPA 72, National Fire Alarm Code;

NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations; and

NFPA 8506, Standard on Heat Recovery Steam Generator Systems.

Q. In your experience, as a risk control specialist, are you satisfied with the proposed design?

A. Yes. Consistent with my previous experience with NESCO facilities, the SE2 management and engineering staff is committed to designing and operating a safe facility, and to complying with all applicable regulations, codes and industry standards.

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Diesel Fuel Tank

Q. Please describe the proposed design of the diesel fuel tank.

A. According to SE2's Application, there will be a 2.5 million gallon tank for low-sulfur diesel fuel located on the facility site. The tank will be approximately 50 feet high and have a diameter of approximately 100 feet. The tank will be made of welded steel and will satisfy American Petroleum Institute (API) Standard 650. During construction, welds will be tested either radiographically or with air or water pressure, as required by API Standard 650 . The tank will be leak tested with water prior to being filled with diesel for the first time. It will also be certified by an American Society of Mechanical Engineers (ASME) or Underwriters Laboratories (UL) stamp indicating that the tank is leak tight. The tank will be placed on a concrete pad, and surrounded by a bermed and lined containment area.

Q. Is this kind of tank unusual?

A. No. These types of fuel storage tanks are common at power plants and other large industrial facilities. There are, in fact, many large storage tanks in Whatcom County. For example, I understand that at the refinery in Ferndale, there is a 15.5 million gallon tank and a 17.5 million gallon tank used to store propane, a fuel that it much more volatile than diesel fuel.

Q. Can you describe the containment system for the SE2 tank in greater detail?

A. In the Application, SE2 proposes to surround the diesel tank with a containment area of sufficient volume to hold the entire contents of the tank plus 20 minutes of fire

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fighting water, plus 1 foot of freeboard. The area will have earthen berms where the slope of the earthen wall will be consistent with the angle of repose of the material of which the wall is constructed, and will be lined with impervious material, such as which will be covered with sand or gravel to protect it from puncture. In the event of a release of fuel from the tank, the fuel will be contained within the lined containment area, from which it can be removed without any release to the environment.

Q. How does the size of this containment area compare to the regulatory requirements?

A. The Application proposes a containment area with a volume equal to approximately 125% of the volume of the diesel tank. The applicable code – NFPA 30 – requires containment areas to be only 100% of the tank volume.

Q. Will the tank have any devices to prevent over-filling?

A. Yes. According to the Application, the tank will have a tank level indicator that is visible from the delivery truck station as well as an automatic tank level indicator with alarms in the plant's control room. Automatic switching will also shut down pumps delivering fuel or close the tank oil inlet valves as appropriate to stop delivery of fuel once the high level mark is reached.

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Q. You mentioned the truck delivery area. Is that area designed to prevent releases of fuel to the environment?

A. Yes. The truck unloading area will be paved with concrete, and curbed to contain any release of fuel. The area will be covered to minimize collection of stormwater, and all collected water will pass through an oil/water separator.

Q. Does this tank pose a significant risk of fire or explosion?

A. No. It is important to keep in mind that SE2 proposes to store low sulfur No. 2 diesel fuel at the facility. Diesel is not nearly as volatile and flammable as gasoline. The "flash point" is the temperature at which vapors from a fuel flash when ignited by an external flame. It is a direct measure of a liquid's volatility and its tendency to vaporize. The lower the flash point, the greater the risk of fire. Gasoline has flash point of -36^{o}F and is therefore, classified as a Class IA Flammable Liquid. In contrast, No. 2 diesel fuel oil typically has a flash point of around 145^{o}F and is classified as a Class IIIA Combustible Liquid. In order to ignite diesel at normal temperatures and pressures, it must be atomized into small droplets, as is done by a burner in a residential furnace. You could literally put a cigarette out in a pool of diesel fuel without igniting it. Given this relatively low level of volatility, SE2 has, in my view, taken more than adequate precautions to minimize the risk of a fire or explosion associated with the diesel storage tank.

Q. What sort of fire suppression system will SE2 have in and around the tank?

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A. SE2 will have a foam fire suppression system. These foam systems are designed to smother any fire by spreading foam on top of the burning fuel and cutting off the supply of oxygen necessary for combustion to continue. The suppression system will include foam nozzles inside the fuel tank, as well as foam cannons located on the perimeter of the containment area. Temperature monitors inside the tank will detect the fire and trigger the foam system. I should also point out that although the Application refers to a portable foam system, SE2 has since decided to maintain a permanent foam suppression system on site.

Q. How does this system compare with the regulatory requirements?

A. Fixed-roof tanks, like the one proposed by SE2, that store class II or III liquids at temperatures below their flash points generally do not require fire protection when installed in compliance with Section 2-3 of NFPA 30: Storage of Flammable and Combustible Liquids. Therefore, SE2's proposal to add a foam extinguishing system exceeds the current requirements and will enhance the ability of the local fire department in managing a potential fire involving the tank.

Q. What would happen if the foam suppression system didn't work?

A. It is extremely unlikely that a properly designed and maintained foam suppression system would not put out any fire that ignited in or around the diesel storage tank. If that somehow occurred, however, the fuel in the tank and the containment area would continue to burn until the fuel was spent or the fire was extinguished. Local fire authorities would be called upon to provide perimeter and exposure control. The storage tank is relatively isolated on the facility site, but firefighters would take steps

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to ensure that radiant heat from a fire did not ignite any buildings or facilities on adjacent properties.

Q. The Draft Environmental Impact Statement indicates that the local Sumas fire department does not have training and equipment to address a large facility fire. Does this pose a problem?

A. No. It is important to keep in mind, as explained above, if for some reason the foam suppression system did not put out a fire, the role of a local fire department would be to provide perimeter control so that nearby buildings or facilities would not ignite as a result of the radiate heat produced by a fire at the SE2 facility. SE2 intends to provide the local fire department with training and equipment appropriate for this function. SE2 will also explore arrangements with the nearby Whatcom County refineries to provide aid in the event of an emergency at the SE2 facility.

Chemical Storage

Q. How will chemicals be stored at the facility?

A. Some chemicals, such as ammonia and lubricating oils, will be stored at the facility. According to the Application, all liquid storage areas will be above-ground, in concrete floored areas, with concrete curbing or dikes that will create containment areas equal to the entire volume of chemicals plus a margin of safety.

Q. Please describe the ammonia storage tank?

A. There will be a 20,000 gallon aqueous ammonia storage tank at the facility that will provide the ammonia used in the catalytic emission control system. The tank will be

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made of steel, and will be surrounded by a curbed containment area capable of holding the entire volume of the tank plus a margin of safety. The containment area will be equipped with ammonia detectors, and an automatically initiated water deluge system to cool the ammonia storage tank.

Q. Does this ammonia tank pose any risk to the public?

A. No. The ammonia stored at the facility will be aqueous ammonia – a solution of 19% ammonia and 81% water. To put that number in perspective, a freshly opened bottle of household ammonia may be up to ten percent ammonia. Solutions used in blueprint transfers run about 28 percent ammonia and spent blueprint solutions range from 12 to 18 percent ammonia. If the ammonia tank at the SE2 facility leaked, the liquid solution would flow into the containment area, from which it could be safely removed. This sort of aqueous ammonia solution does not vaporize at nearly the rate of anhydrous ammonia, which is not in aqueous solution. In my opinion, SE2 has proposed appropriate safeguards for handling and storing the ammonia, and the ammonia storage does not pose a substantial risk to the public.

END OF TESTIMONY

I declare under penalty of perjury that the above testimony is true and correct to the best of my knowledge.

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DATED: April _____, 2000.

By _____
Michael Woltersdorf

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